



CERTSWARRIOR

# K-12 MCAS-Math

## Massachusetts Comprehensive Assessment System

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# Latest Version: 6.0

## Question: 1

$F(x) = 5x + 10$ . If  $x = 10$ , then what is the value of  $f(x)$ ?

- A. 25
- B. 60
- C. 12
- D. 5

**Answer: B**

Explanation:

The equation describes a functional relationship between  $x$  and  $f(x)$ . To solve the equation, substitute 10 as the value of  $x$ , such that  $f(10) = 5(10) + 10 = 50 + 10 = 60$ .

## Question: 2

The table below lists values for  $x$  and  $f(x)$ .

$x$	$f(x)$
1	2
2	5
3	10
4	17
5	26

Which of the following equations describes the relationship between  $x$  and  $f(x)$ ?

- a.  $f(x) = x + 1$
- b.  $f(x) = x^2$
- c.  $f(x) = (-x)^2$
- d.  $f(x) = x^2 + 1$

**Answer: D**

Explanation:

For each value of  $x$ ,  $f(x) = x + 1$

$$f(1) = (1)^2 + 1 = (1)(1) + 1 = 1 + 1 = 2$$

$$f(2) = (2)^2 + 1 = (2)(2) + 1 = 4 + 1 = 5$$

$$f(3) = (3)^2 + 1 = (3)(3) + 1 = 9 + 1 = 10$$

$$f(4) = (4)^2 + 1 = (4)(4) + 1 = 16 + 1 = 17$$

$$f(5) = (5)^2 + 1 = (5)(5) + 1 = 25 + 1 = 26$$

### Question: 3

Mrs. Rose has 16 students in her class. Her class has three times as many girls as boys. How many girls and boys are in Mrs. Rose's class?

- A. 12 girls, 4 boys
- B. 4 girls, 12 boys
- C. 3 girls, 1 boy
- D. 9 girls, 7 boys

**Answer: A**

Explanation:

Let  $x$  represent the number of boys in Mrs. Rose's class. Since Mrs. Rose has three times as many girls in her class as boys,  $3x$  represents the number of girls in Mrs. Rose's class. The total number of students in the class is 16. Written as an equation and solved for  $x$  we get:

$$x + 3x = 16$$

$$4x = 16$$

$$x = 4$$

Hence  $x = 4$  and  $3x = 12$ . Therefore, 4 is the number of boys and 12 is the number of girls. Also,  $4 + 12 = 16$ , the total number of students in the class.

### Question: 4

What was Liz's initial weight?

- A. 150 pounds
- B. 170 pounds
- C. 180 pounds
- D. 195 pounds

**Answer: C**

Explanation:

According to the graph, in month 1, Liz weighed 180 pounds.

### Question: 5

How much weight did Liz lose by month 2?

- A. 30 pounds
- B. 20 pounds
- C. 10 pounds
- D. 0 pounds

**Answer: A**

Explanation:

In month 1, Liz weighed 180 pounds. By month 2, Liz weighed 150 pounds. Since  $180 - 150 = 30$ , Liz lost 30 pounds by month 2.

### Question: 6

Did Liz lose or gain weight from month 2 to month 4? How much weight did Liz lose or gain?

- A. Liz lost 40 pounds
- B. Liz gained 40 pounds
- C. Liz lost 20 pounds
- D. Liz gained 20 pounds

**Answer: B**

Explanation:

In month 2, Liz weighed 150 pounds but she weighed 190 pounds in month 4. Since  $190 - 150 = 40$ , Liz gained 40 pounds from month 2 to month 4.

### Question: 7

Which of the following statements is not supported by the weight loss data in Figure 1?

- A. Liz lost 30 pounds by the second month of her diet.
- B. Liz weighed more after the fourth month of her diet than she weighed at the beginning of her diet.
- C. Liz experienced slow but consistent weight loss after month 4 of her diet.

D. Liz's rapid weight loss was sustainable for all 12 months of her diet.

**Answer: D**

Explanation:

Liz experienced a rapid weight loss of 30 pounds by month 2; however she gained 40 pounds over the next 2 months, and her resulting weight was greater than her weight at the beginning of her diet. Therefore, her rapid weight loss was NOT sustainable for all 12 months of her diet.

### Question: 8

Which of the following statements is most supported by the weight loss data in Figure 1?

- A. The most Liz weighed was 180 pounds over the entire course of her diet
- B. Liz lost weight every month during the entire 12 months of her diet
- C. Liz did not meet her weight loss goal
- D. Liz met her weight loss goal in month 12 through slow, consistent weight loss over time

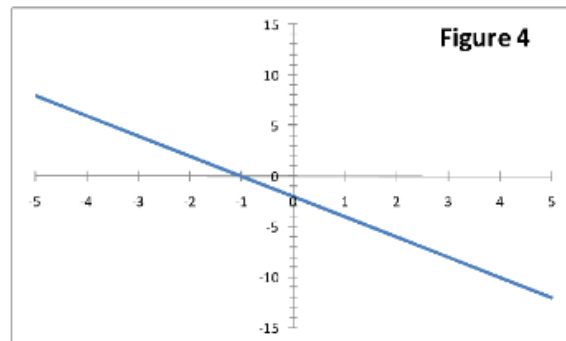
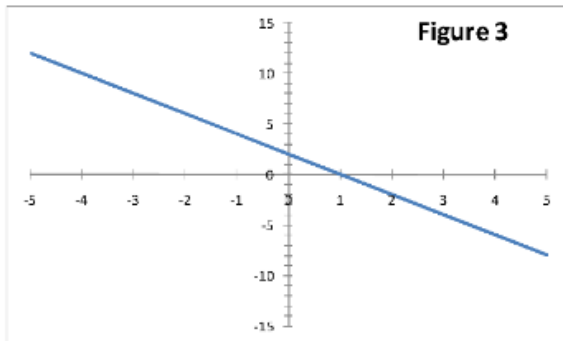
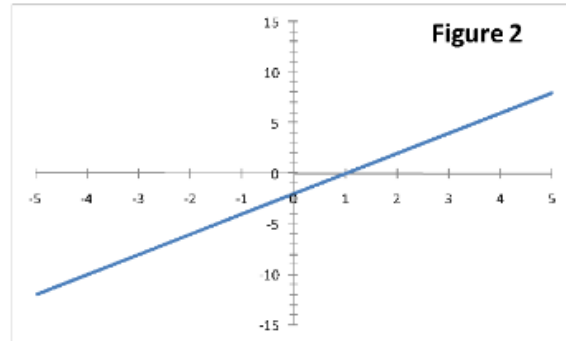
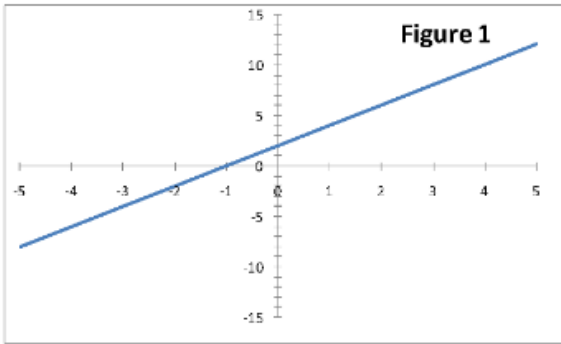
**Answer: D**

Explanation:

Liz weighed 150 pounds by month 12, which was 30 pounds less than her initial 180 pounds. Thus Liz met her weight loss goal. Furthermore, from month 4 to month 12, Liz lost 5 pounds per month, which means she met her goal through slow, consistent weight loss over time. Answer A is incorrect because Liz weighed 190 pounds during month 4. Answer B is incorrect because Liz gained weight between month 2 and month 4. Answer C is incorrect because Liz did meet her 30 pound weight loss goal.

### Question: 9

Which of the following figures contains a graph of the function  $y = 2x + 2$ ?



- A. Figure 1
- B. Figure 2
- C. Figure 3
- D. Figure 4

**Answer: A**

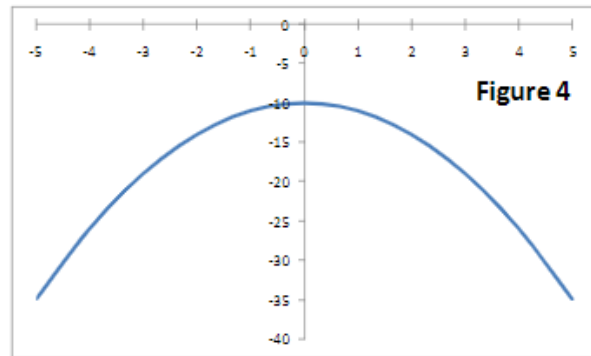
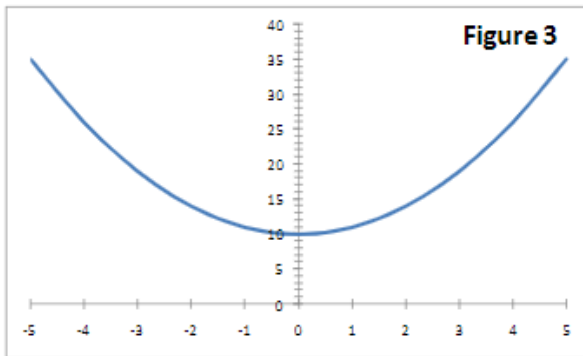
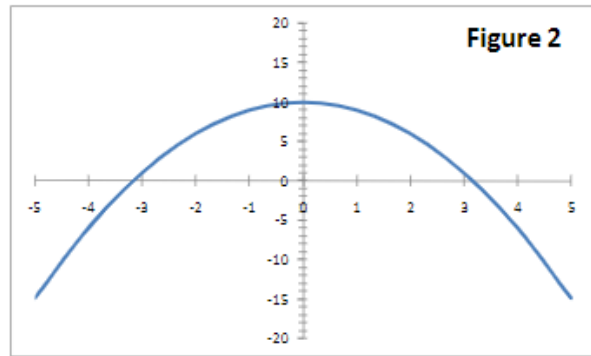
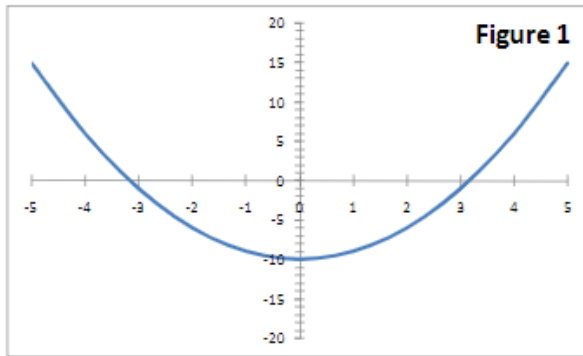
Explanation:

The equation is written in the form of the point slope formula:  $y = mx + b$  where  $m$  is the slope of the line and  $b$  is the y-axis intercept. For the given equation  $y = 2x + 2$ , the slope of the line is positive 2 and the line intercepts the y-axis at positive 2. The graph in Figure 1 fits these criteria.

The graph in Figure 2 intercepts the y-axis at negative 2. The graphs in Figure 3 and Figure 4 have slopes of negative 2.

## Question: 10

Which of the following figures contains a graph of the function  $y = x^2 + 10$ ?



- A. Figure 1
- B. Figure 2
- C. Figure 3
- D. Figure 4

**Answer: C**

Explanation:

The equation is written in the form  $y = Ax^2 + B$  where  $A$  tells the concavity of the graph and  $B$  is the  $y$ -intercept. In this case,  $A$  equals positive 1. So the graph is concave up.  $B$  equals positive 10. So the graph intercepts the  $y$ -axis at positive 10. The graph in Figure 3 fits these criteria. The graph in Figure 1 intercepts the  $y$ -axis at negative 10. The graphs in Figure 2 and Figure 4 are concave down.



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